

## PATENT ABSTRACTS OF JAPAN

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(54) OIL AND FAT-CONTAINING WATER-SOLUBLE COMPOSITION AND REFRESHMENT CONTAINING THE SAME

(57)Abstract:

PURPOSE: To obtain an oil and fat-containing water-soluble composition having excellent acid resistance, salt resistance and heat resistance and refreshments having excellent acid resistance, salt resistance and heat resistance without generating creaming and capable of keeping uniform emulsifying or soluble state without separating oil and fat even preserving for a long period of time by including the same composition. CONSTITUTION: The objective emulsifiable or solubilized oil and fat-containing water-soluble composition is composed of at least one kind of polyglycerin fatty acid ester selected from a monoester of a polyglycerin having  $\geq 10$  polymerization degree with an 8-18C fatty acid, a sugar fatty acid ester containing  $\geq 90\%$  monoester of sucrose with a fatty acid, oil and fat and residual part of water.

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CLAIMS

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[Claim(s)]

[Claim 1] The fats-and-oils content water solubility constituent characterized by being in emulsification or a solubilization condition by the sucrose fatty acid ester which contains the monoester of the at least one sort of polyglyceryl fatty acid ester, the cane sugar, and the fatty acid which are chosen from the monoester of with a polymerization degree of ten or more polyglycerin and the fatty acid of carbon numbers 8-18 90% or more, and fats and oils and the remainder consisting of water.

[Claim 2] The eating-and-drinking article containing a fats-and-oils content water solubility constituent according to claim 1.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the eating-and-drinking article containing a fats-and-oils content water solubility constituent and this excellent in acid resistance, the salt atmosphere, and thermal resistance.

[0002]

[Description of the Prior Art] To maintain uniform emulsification or a solubilization condition is desired without producing a creaming or fats and oils dissociating by the eating-and-drinking article, especially the drink, even if it excels in acid resistance, the salt atmosphere, and thermal resistance and being saved for a long period of time in order to blend various additives and to carry out heat sterilization processing when carrying out addition combination of the fats and oils at the drink. In order to develop such an eating-and-drinking article, various examination has so far been made. For example, the approach (JP,62-125850.A) of gelling using gellant gum, the approach (JP,63-119845.A) using the microcapsule which has a capsule wall containing polyamine, the method (JP,2-257838.A) of making the hydrolyzate of milk serum protein contain, etc. are proposed.

[0003]

[Problem(s) to be Solved by the Invention] However, the approach of gelling using gellant gum has a problem in acid resistance, the approach using the microcapsule which has a capsule wall containing polyamine has a problem in thermal resistance, and the approach of making the hydrolyzate of milk serum protein containing has a problem in the salt atmosphere. Thus, acid resistance, the salt atmosphere, and thermal resistance are excellent, there are no all and what can maintain stable emulsification or a solubilization condition under these conditions cannot say them as what may fully be satisfied. Therefore, even if it excels in acid resistance, the salt atmosphere, and thermal resistance and being saved for a long period of time, uniform emulsification or a solubilization condition can be maintained without producing a creaming or fats and oils' dissociating, and it has been a technical problem to prepare the fats-and-oils content water solubility constituent which can be widely adapted for various food. The purpose of this invention is offering the fats-and-oils content water solubility constituent excellent in acid resistance, the salt atmosphere, and thermal resistance, and even if it excels in acid resistance, the salt atmosphere, and thermal resistance and saves by blending this constituent for a long period of time, it is to offer the eating-and-drinking article containing the fats and oils which can maintain uniform emulsification or a solubilization condition without producing a creaming or fats and oils' dissociating.

[0004]

[Means for Solving the Problem] If this invention persons use a specific emulsifier and make fats and oils emulsify or solubilize as a result of inquiring wholeheartedly for the purpose of offering the fats-and-oils content water solubility constituent excellent in acid resistance, the salt atmosphere, and thermal resistance It excelled in acid resistance, the salt atmosphere, and thermal resistance, and even if it saved the eating-and-drinking article which blended this constituent for a long period of time, it finds out that uniform emulsification or a solubilization condition can be maintained without producing a creaming or fats and oils' dissociating, and came to complete this invention based on this knowledge. That is, it is the fats-and-oils content water solubility constituent with which the sucrose fatty acid ester which contains the monoester of the at least one sort of polyglyceryl fatty acid ester, the cane sugar, and the fatty acid which are chosen from monoester with the fatty acid of the with a polymerization degree [ 1st ] of ten or more polyglycerin and the carbon numbers 8-18 of this invention 90% or more, and fats and oils and the remainder are characterized by being in emulsification or a solubilization condition by consisting of water, and the 2nd of this invention is related with the eating-and-drinking article containing the aforementioned fats-and-oils content water solubility constituent.

[0005] This invention is explained below at a detail. The fats and oils used for this invention are the fats and oils or synthetic oil which can use any fats and oils and uses as a raw material the animal which is generally edible oil, vegetation, and a microorganism. For example, it is fats and oils which blended synthetic triglycerides, such as medium-chain-fatty-acid triglycerides, such as lard, beef tallow, chicken oil, whale oil, a tuna oil, sardine oil, the Sabah oil, a Pacific saury oil, a bonito oil, a herring oil, liver oil, soybean oil, cotton seed oil, safflower oil, rice bran oil, corn oil, rapeseed oil, palm oil, a beefsteak plant oil, sesame oil, cacao butter, peanut oil, and palm oil, etc., and is independent about these, or it can combine suitably and can use. It is usually appropriate to blend preferably, the loadings of the fats and oils in this invention 0.0005 to 70% of the weight, so that it may become 0.003 - 50 % of the weight more preferably 0.001 to 60% of the weight.

The fats-and-oils content water solubility constituent which has practical value if the loadings of fats and oils are 0.0005 % of the weight or more can be obtained, and if it is 70 or less % of the weight, stability can be made to emulsify or solubilize fats and oils easily.

[0006] As polyglyceryl fatty acid ester used for this invention, at least one sort of compounds chosen from monoester with a polymerization degree of ten or more polyglycerin and the fatty acid of carbon numbers 8-18, for example, a caprylic acid, a capric acid, a lauric acid, a myristic acid, a palmitic acid, stearin acid, oleic acid, and linolic acid are used. As for the cases other than the range of the fatty acid of carbon numbers 8-18, emulsification becomes unstable. The loadings of the polyglyceryl fatty acid ester used for this invention are 0.00003 - 20 % of the weight usually 0.0001 - 10 % of the weight more preferably 0.00005 to 15% of the weight. If the loadings of polyglyceryl fatty acid ester are 0.00003 % of the weight or more, stability can be made to emulsify or solubilize fats and oils easily, and if it is 20 or less % of the weight, the fats-and-oils content water solubility constituent which has practical value can be obtained.

[0007] The compound which usually contains the monoester of the at least one sort of fatty acids and cane sugar which are chosen from the saturated fatty acid of the carbon numbers 12-18 of a beef tallow hardening fatty acid etc., for example, a lauric acid, a myristic acid, a palmitic acid, and stearin acid 90% or more as sucrose fatty acid ester used for this invention is used. As a commercial item, there is DK ester SS (95% monoester: Dai-Ichi Kogyo Seiyaku Co., Ltd. make), for example. The loadings of the sucrose fatty acid ester of this invention are 0.00003 - 20 % of the weight usually 0.0001 - 10 % of the weight more preferably 0.00005 to 15% of the weight. If the loadings of sucrose fatty acid ester are 0.00003 % of the weight or more, stability can be made to emulsify or solubilize fats and oils easily, and if it is 20 or less % of the weight, the fats-and-oils content water solubility constituent which has practical value can be obtained.

[0008] In this invention, other surfactants can be mixed and used for the above-mentioned surfactant. There are the saponin which are a sorbitan fatty acid ester, a glycerine fatty acid ester, propylene glycol fatty acid ester and lecithin, and a natural emulsifier as these surface active agents, a sterol, cholic acid, DESOKISHI cholic acid, a yucca extract, etc.

[0009] Furthermore, a stabilizer can be added to this invention. independent [ in polyhydric alcohol, such as gum arabic, xanthan gum, tragacanth gum, Cyamoposis Gum, gellant gum, locust bean gum, etc. propylene glycol, a glycerol or sugar-alcohol, for example, maltitol, a restoration water candy, the Lacty toll, palatinit, erythritol a sorbitol, and a mannitol, ] as a stabilizer used for this invention — or two or more sorts can be mixed.

[0010] In order to raise emulsification or solubilization stability of the fats-and-oils content water solubility constituent of this invention, homogenization machines, such as a colloid mill, a high-pressure homogenizer, a Micro fluidizer, and a nano mizer, an ultrasonic emulsifier, can be used.

[0011] Furthermore, the fats-and-oils content water solubility constituent of this invention can perform 100-150-degree C pasteurization or sterilization processing sterilization processing or if needed at 60-100 degrees C. Thus, the obtained fats-and-oils content water solubility constituent can maintain uniform emulsification or a solubilization condition, without producing a creaming or fats and oils dissociating, even if saved for a long period of time.

[0012] Even if it excels in acid resistance, the salt atmosphere, and thermal resistance and being saved for a long period of time, the purpose of this invention is offering the eating-and-drinking article containing the fats and oils which can maintain uniform emulsification or a solubilization condition without producing a creaming or fats and oils' dissociating, and can be attained on the occasion of manufacture of various eating-and-drinking articles by carrying out addition combination of the fats-and-oils content water solubility constituent of this invention. The fats-and-oils content water solubility constituent obtained as mentioned above can be taken in as it is, or can mainly be used for food, such as drinks and pans, such as a sport drink, a carbonated drink, and a nutrition drink, noodles, confectionary, milk processed meat, and a seasoning, as a feed ingredient for adding fats and oils, and the range does not exist and can apply especially a limit to all kinds of eating-and-drinking article.

[0013] As food containing the fats-and-oils content water solubility constituent of this invention, it hangs down and \*\*\*\* processed foods and bean paste, such as a pan and confectionary, such as a pan, a biscuit, Kandy, and jelly, and yogurt, a hum, the source, the health food made into the shape of the shape of powdered food, such as fats-and-oils processed foods and powder drinks, such as processed foods and margarine, such as seasonings and tofu, such as a dressing, and noodles, a fat-spread and shortening, and powdered soup, etc. and a capsule and a tablet, powder, granularity, etc. can be mentioned, for example

[0014] When considering as the drink containing the fats-and-oils content water solubility constituent of this invention, the high density liquid diet for the alimentation before liquid milk containing recombined milk besides being the drink which contains at least one sort out of minerals, such as salt, an acidulant, sweeteners, alcohol, a vitamin, a flavor, and fruit juice, for example, a sport drink, a fruit-juice drink, a lactic acid bacteria beverage, an alcoholic beverage, a vitamin mineral drink, etc., soybean milk, and an operation, after an operation, etc. can be mentioned.

[0015] When the fats-and-oils content water solubility constituent of this invention is used for a drink, the drink can maintain uniform emulsification or a solubilization condition, without producing a creaming or fats and oils dissociating, even if saved for a long period of time. The drink containing the fats-and-oils content water solubility constituent of this invention can perform 100-150-degree-C pasteurization or sterilization processing sterilization processing or if needed at 60-100 degrees C.

[0016]

[Example] Next, an example and the example of a comparison explain this invention to a detail further.

the 150ml \*\*\*\*\* centrifugal precipitation tube of examples — deca glycerol MONOKAPURI rate [— trade name: — SY Glyster MCA-750 and the product made from Sakamoto Pharmaceutical industry — in order to see] 4g, [trade name:DK ester SS and Dai-Ichi Kogyo Seiyaku Co., Ltd. make] made from sucrose fatty acid ester 4g which contains monoester 95%, and acid resistance and to see 0.2g of citric acids, and the salt atmosphere, 0.2g of sodium citrates and 9.6g of water were put in, and it was made to dissolve completely the solution — medium-chain-fatty-acid triglyceride [— trade name: — PANASETO 810 and the Nippon Oil & Fats Co., Ltd. make —] 2g was put in, probe mold SONIKETA [form:SONIFIER 250 and the product made from BRANSON SONIC POWER COMPANY] was used, emulsification was performed for 1 minute, and the homogeneous fats-and-oils content water solubility constituent was obtained.

[0017] Except [ of the deca glycerol MONOKAPURI rate of example of comparison 1 example 1 ] instead having used the hexa glycerol MONOKAPURI rate [trade name:SY Glyster MCA-500 and the product made from Sakamoto Pharmaceutical industry], the completely same actuation as an example 1 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0018] The sucrose-fatty-acid-ester [trade name which contains monoester 70% instead of the sucrose fatty acid ester which contains the monoester of example [ of a comparison ] 2 example 1 95%: Except having used DK ester F-160 and] by Dai-Ichi Kogyo Seiyaku Co., Ltd., the completely same actuation as an example 1 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0019] the beaker made from example 23 liter-capacity stainless steel — deca glycerol monostearate [— trade name: — SY Glyster MS-750 and the product made from Sakamoto Pharmaceutical industry — in order to see] 100g, [trade name:DK ester SS and Dai-Ichi Kogyo Seiyaku Co., Ltd. make] made from sucrose fatty acid ester 100g which contains monoester 95%, and acid resistance and to see 70g of acetic acids, and the salt atmosphere, 30g of salt and 260g of water were put in, and it was made to dissolve completely the solution — soybean lecithin [— trade name: — Nissin lecithin and the Nisshin Oil Mills, Ltd. make — the oil phase which mixed] 40g and 1400g of rapeseed oil was mixed and stirred gradually, subsequently, it homogenized by the homogenization pressure of 300kg/cm<sup>2</sup>, and three counts of pass with the homogenizer [form:120 L/H and the product made from Sanwa Machine], and the homogeneous mayonnaise's fats-and-oils content water solubility constituent was obtained.

[0020] Except [ of the deca glycerol monostearate of example of comparison 3 example 2 ] instead having used deca glycerol tristearate [trade name:SY Glyster TS-750 and the product made from Sakamoto Pharmaceutical industry], the completely same actuation as an example 2 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0021] The sucrose-fatty-acid-ester [trade name which contains monoester 75% instead of the sucrose fatty acid ester which contains the monoester of example [ of a comparison ] 4 example 2 95%: Except having used the Ryoto sugar ester S-1670 and] made from Mitsubishi Kasei Food, the completely same actuation as an example 2 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0022] the beaker made from example 31 liter-capacity stainless steel — decaglycerin monooleate [— trade name: — SunSoft Q-17S and the TAIYO KAGAKU CO., LTD. make — in order to see] 15g, [trade name:DK ester SS and Dai-Ichi Kogyo Seiyaku Co., Ltd. make] made from sucrose fatty acid ester 15g which contains monoester 95%, and acid resistance, 7.5g of sodium ascorbate, [glycerol for trade name:food additives and Nippon Oil & Fats Co., Ltd. make] made from glycerol 150g, and 90g of water were put into the 2.5g [ of ascorbic acids ], and salt atmosphere \*\*\*\* sake, and it was made to dissolve completely the solution — mono-glycerine fatty acid ester [— trade name: — EMARUJI MU and the Riken Vitamin Co., Ltd. make — the oil phase which mixed] 15g, [trade name:SANRESHICHIN W-1 and TAIYO KAGAKU CO., LTD. make] made from lecithin 5g, and [trade name:SANOMEGA DHA27 and Nippon Oil & Fats Co., Ltd. make] made from purification tuna oil 200g — gradually — mixing and stirring — carrying out — subsequently — a Micro fluidizer [Form : M-110 E/H and product made from Mizuho Industry] It homogenized by the homogenization pressure of 1500kg/cm<sup>2</sup>, and one count of pass, and the homogeneous fats-and-oils content water solubility constituent was obtained.

[0023] Except having used only 30g (DK ester SS) of sucrose fatty acid ester which contains monoester 95% instead of 15g of sucrose fatty acid ester which contains decaglycerin monooleate 15g of example of comparison 5 example 3, and monoester 95%, the completely same actuation as an example 3 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0024] Except having used only decaglycerin monooleate 30g instead of 15g of sucrose fatty acid ester which contains decaglycerin monooleate 15g of example of comparison 6 example 3, and monoester 95% (DK ester SS), the completely same actuation as an example 3 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0025] Each fats-and-oils content water solubility constituent of examples 1-3 was shown in Table 1.

[0026]

[Table 1]

表 1

		実 施 例		
		1	2	3
乳 化 剤	A	デカグリセリン モノカステレート 20	デカグリセリン モノステレート 5	デカグリセリン モノオレート 3
	B	シヨ糖脂肪酸 モノエステル95% 20	シヨ糖脂肪酸 モノエステル95% 5	シヨ糖脂肪酸 モノエステル95% 3
油 脂		ハチート810 10	ナツ油 70	マクロ油 40
水		48	13	18
酸		クエン酸 1	酢酸 3.5	アスコルビン酸 0.5
塩		クエン酸ソーダ 1	食塩 1.5	アスコルビン酸ナトリウム 1.5
その他		—	レシチン 2	レシチン他 34

(単位：重量%)

[0027] Each fats-and-oils content water solubility constituent of the examples 1-6 of a comparison was shown in Table 2.

[0028]

[Table 2]

表 2

		比較例					
		1	2	3	4	5	6
乳 化 剤	A	ヘキサグリセリン モノカプリレート 20	デカグリセリン モノカプリレート 20	デカグリセリン トリスアレート 5	デカグリセリン モノアレート 5	—	デカグリセリン モノオレート 6
	B	ソコ糖脂肪酸 モノエステル95% 20	ソコ糖脂肪酸 モノエステル70% 20	ソコ糖脂肪酸 モノエステル95% 5	ソコ糖脂肪酸 モノエステル75% 5	ソコ糖脂肪酸 モノエステル95% 6	—
油脂		ハチート810 10	ハチート810 10	タネ油 70	タネ油 70	マグロ油 40	マグロ油 40
水		48	48	13	13	18	18
酸		クエン酸 1	クエン酸 1	酢酸 3.5	酢酸 3.5	アスコルビン酸 0.5	アスコルビン酸 0.5
塩		クエン酸ソーダ 1	クエン酸ソーダ 1	食塩 1.5	食塩 1.5	アスコルビン酸 ナトリウム 1.5	アスコルビン酸 ナトリウム 1.5
その他		—	—	ビタミン 2	ビタミン 2	ビタミン他 34	ビタミン他 34

(単位：重量%)

[0029] The emulsion stability of Ushiro who took 20g to 30ml \*\* glassware, and heat-sterilized each fats-and-oils content water solubility constituent of examples 1-3 and the examples 1-6 of a comparison for 30 minutes at 85 degrees C was evaluated. Moreover, the emulsion stability when saving these fats-and-oils content water solubility constituents at 60-degree-C thermostat during 15 days was evaluated. The evaluation result was shown in Table 3.

[0030]

[Table 3]

表 3

	平均粒径 ( $\mu$ )	85℃で30分間の 加熱後の乳化安定性	60℃で15日間の 保存後の乳化安定性
実施例 1	0.24	良好	良好
実施例 2	0.28	良好	良好
実施例 3	0.21	良好	良好
比較例 1	測定不能	分離	分離
比較例 2	測定不能	分離	分離
比較例 3	測定不能	分離	分離
比較例 4	測定不能	分離	分離
比較例 5	1.11	良好	分離
比較例 6	1.28	良好	分離

[0031] From the result of Table 3, a citric acid is added as acid resistance, a sodium citrate is added as the salt atmosphere in the example 1, and it is acid resistance at an example 2. Salt can be added as an acetic acid and the salt atmosphere, in the example 3, even if it heat-sterilizes for 30 minutes at 85 degrees C, also when emulsion stability is good and saves clearly at 60-degree-C thermostat during 15 days, it does not dissociate, but these fats-and-oils content water solubility constituent that added the ascorbic acid as acid resistance and added sodium ascorbate as the salt atmosphere excels [ all ] in acid resistance, the salt atmosphere, and thermal resistance, and they can use it as the raw material of an eating-and-drinking article, or an eating-and-drinking article. It dissociated, when it saved at 60-degree-C thermostat during 15 days, although emulsified in Ushiro who mean particle diameter of emulsification is stable about examples 1-3 less than [ 0.3mmicro ], emulsified liquid dissociates in the examples 1-4 of a comparison, measurement is impossible, and mean particle diameter is large in the examples 5-6 of a comparison at more than 1.0mmicro, and was not stabilized by the emulsification condition, but heat-sterilized for 30 minutes at 85 degrees C.

[0032] Each ingredient was blended and stirred by the presentation of example 4 table 4, and the source was obtained. After saving for three months immediately after manufacture of this source, and at 10 degrees C, when emulsion stability was evaluated, separation of an oil phase was not accepted at all, but emulsification was stable.

[0033]

[Table 4]



表 4

材 料	配合量 (g)
実施例 2 の油脂含有水溶性組成物	4 0 0
トマトケチャップ	1 2 0
プレーンヨーグルト	6 0
練り辛子	1 0
パブリカ	1 0

[0034] In example of comparison 7 example 4, the source was obtained like the example 4 except having changed the fats-and-oils content water solubility constituent of the example 2 in the charge of a compounding agent of Table 2 into the fats-and-oils content water solubility constituent of the example 3 of a comparison. After saving for three months immediately after manufacture of these sources, and at 10 degrees C, when emulsion stability was evaluated, in any case, separation of an oil phase was accepted, and it was judged that emulsification was unstable and could not be used as a product.

[0035] The drink was prepared with each ingredient of the presentation shown in example 5 table 5, and 100ml \*\* bottle was filled up and it sealed. This drink was heat-sterilized for 15 minutes at 95 degrees C, and the drink was obtained. Thus, after saving the obtained drink for two months at 40 degrees C, when emulsion stability was evaluated, separation of an oil phase was not accepted at all, but emulsification was stable.

[0036]

[Table 5]

表 5

材 料	配合量 (g)
実施例 3 の油脂含有水溶性組成物	0 . 0 1 3
上白糖	5 8 . 3 0
ブドウ糖	6 . 0 0
クエン酸	1 . 8 0
食塩	0 . 3 5
クエン酸ナトリウム	0 . 3 0
アスコルビン酸	0 . 0 6
アスコルビン酸ナトリウム	0 . 0 1
リン酸三カリウム	0 . 0 4
リン酸三カルシウム	0 . 0 8
シトラスミックスフレーバー	1 . 0 0
水	9 3 2 . 0 4 7

[0037] In example of comparison 8 example 5, the drink was obtained like the example 5 except having changed the fats-and-oils content water solubility constituent of the example 3 in the charge of a compounding agent of Table 5 into the fats-and-oils content water solubility constituent of the example 6 of a comparison. In any case, when emulsion stability was evaluated like the example 5, the creaming produced these drinks, and emulsification is unstable and was not able to be used as a product.

[0038]

[Effect of the Invention] The fats-and-oils content water solubility constituent of this invention is a fats-and-oils content water solubility constituent excellent in acid resistance, the salt atmosphere, and thermal resistance emulsified or solubilized. Even if it excels in acid-proof, a salt-proof, and thermal resistance and saves for a long period of time by carrying out addition combination of this fats-and-oils content water solubility constituent on the occasion of manufacture of various eating-and-drinking articles, the eating-and-drinking article containing the fats and oils which can maintain uniform emulsification or a solubilization condition without producing a creaming or fats and oils' dissociating can be offered.

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TECHNICAL FIELD

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[Industrial Application] This invention relates to the eating-and-drinking article containing a fats-and-oils content water solubility constituent and this excellent in acid resistance, the salt atmosphere, and thermal resistance.

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PRIOR ART

[Description of the Prior Art] To maintain uniform emulsification or a solubilization condition is desired without producing a creaming or fats and oils dissociating by the eating-and-drinking article, especially the drink, even if it excels in acid resistance, the salt atmosphere, and thermal resistance and being saved for a long period of time in order to blend various additives and to carry out heat sterilization processing when carrying out addition combination of the fats and oils at the drink. In order to develop such an eating-and-drinking article, various examination has so far been made. For example, the approach (JP,62-125850,A) of gelling using gellant gum, the approach (JP,63-119845,A) using the microcapsule which has a capsule wall containing polyamine, the method (JP,2-257838,A) of making the hydrolyzate of milk serum protein contain, etc. are proposed.

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EFFECT OF THE INVENTION

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[Effect of the Invention] The fats-and-oils content water solubility constituent of this invention is a fats-and-oils content water solubility constituent excellent in acid resistance, the salt atmosphere, and thermal resistance emulsified or solubilized. Even if it excels in acid-proof, a salt-proof, and thermal resistance and saves for a long period of time by carrying out addition combination of this fats-and-oils content water solubility constituent on the occasion of manufacture of various eating-and-drinking articles, the eating-and-drinking article containing the fats and oils which can maintain uniform emulsification or a solubilization condition without producing a creaming or fats and oils' dissociating can be offered.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] However, the approach of gelling using gellant gum has a problem in acid resistance, the approach using the microcapsule which has a capsule wall containing polyamine has a problem in thermal resistance, and the approach of making the hydrolyzate of milk serum protein containing has a problem in the salt atmosphere. Thus, acid resistance, the salt atmosphere, and thermal resistance are excellent, there are no all and what can maintain stable emulsification or a solubilization condition under these conditions cannot say them as what may fully be satisfied. Therefore, even if it excels in acid resistance, the salt atmosphere, and thermal resistance and being saved for a long period of time, uniform emulsification or a solubilization condition can be maintained without producing a creaming or fats and oils' dissociating, and it has been a technical problem to prepare the fats-and-oils content water solubility constituent which can be widely adapted for various food. The purpose of this invention is offering the fats-and-oils content water solubility constituent excellent in acid resistance, the salt atmosphere, and thermal resistance, and even if it excels in acid resistance, the salt atmosphere, and thermal resistance and saves by blending this constituent for a long period of time, it is to offer the eating-and-drinking article containing the fats and oils which can maintain uniform emulsification or a solubilization condition without producing a creaming or fats and oils' dissociating.

[0004]

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## MEANS

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[Means for Solving the Problem] If this invention persons use a specific emulsifier and make fats and oils emulsify or solubilize as a result of inquiring wholeheartedly for the purpose of offering the fats-and-oils content water solubility constituent excellent in acid resistance, the salt atmosphere, and thermal resistance. It excelled in acid resistance, the salt atmosphere, and thermal resistance, and even if it saved the eating-and-drinking article which blended this constituent for a long period of time, it finds out that uniform emulsification or a solubilization condition can be maintained without producing a creaming or fats and oils' dissociating, and came to complete this invention based on this knowledge. That is, it is the fats-and-oils content water solubility constituent with which the sucrose fatty acid ester which contains the monoester of the at least one sort of polyglyceryl fatty acid ester, the cane sugar, and the fatty acid which are chosen from monoester with the fatty acid of the with a polymerization degree [ 1st ] of ten or more polyglycerin and the carbon numbers 8-18 of this invention 90% or more, and fats and oils and the remainder are characterized by being in emulsification or a solubilization condition by consisting of water, and the 2nd of this invention is related with the eating-and-drinking article containing the aforementioned fats-and-oils content water solubility constituent.

[0005] This invention is explained below at a detail. The fats and oils used for this invention are the fats and oils or synthetic oil which can use any fats and oils and uses as a raw material the animal which is generally edible oil, vegetation, and a microorganism. For example, it is fats and oils which blended synthetic triglycerides, such as medium-chain-fatty-acid triglycerides, such as lard, beef tallow, chicken oil, whale oil, a tuna oil, sardine oil, the Sabah oil, a Pacific saury oil, a bonito oil, a herring oil, liver oil, soybean oil, cotton seed oil, safflower oil, rice bran oil, corn oil, rapeseed oil, palm oil, a beefsteak plant oil, sesame oil, cacao butter, peanut oil, and palm oil, etc., and is independent about these, or it can combine suitably and can use. It is usually appropriate to blend preferably, the loadings of the fats and oils in this invention 0.0005 to 70% of the weight, so that it may become 0.003 - 50 % of the weight more preferably 0.001 to 60% of the weight. The fats-and-oils content water solubility constituent which has practical value if the loadings of fats and oils are 0.0005 % of the weight or more can be obtained, and if it is 70 or less % of the weight, stability can be made to emulsify or solubilize fats and oils easily.

[0006] As polyglyceryl fatty acid ester used for this invention, at least one sort of compounds chosen from monoester with with a polymerization degree of ten or more polyglycerin and the fatty acid of carbon numbers 8-18, for example, a caprylic acid, a capric acid, a lauric acid, a myristic acid, a palmitic acid, stearin acid, oleic acid, and linolic acid are used. As for the cases other than the range of the fatty acid of carbon numbers 8-18, emulsification becomes unstable. The loadings of the polyglyceryl fatty acid ester used for this invention are 0.00003 - 20 % of the weight usually 0.0001 - 10 % of the weight more preferably 0.00005 to 15% of the weight. If the loadings of polyglyceryl fatty acid ester are 0.00003 % of the weight or more, stability can be made to emulsify or solubilize fats and oils easily, and if it is 20 or less % of the weight, the fats-and-oils content water solubility constituent which has practical value can be obtained.

[0007] The compound which usually contains the monoester of the at least one sort of fatty acids and cane sugar which are chosen from the saturated fatty acid of the carbon numbers 12-18 of a beef tallow hardening fatty acid etc., for example, a lauric acid, a myristic acid, a palmitic acid, and stearin acid 90% or more as sucrose fatty acid ester used for this invention is used. As a commercial item, there is DK ester SS (95% monoester: Dai-Ichi Kogyo Seiyaku Co., Ltd. make), for example. The loadings of the sucrose fatty acid ester of this invention are 0.00003 - 20 % of the weight usually 0.0001 - 10 % of the weight more preferably 0.00005 to 15% of the weight. If the loadings of sucrose fatty acid ester are 0.00003 % of the weight or more, stability can be made to emulsify or solubilize fats and oils easily, and if it is 20 or less % of the weight, the fats-and-oils content water solubility constituent which has practical value can be obtained.

[0008] In this invention, other surfactants can be mixed and used for the above-mentioned surfactant. There are the saponin which are a sorbitan fatty acid ester, a glycerine fatty acid ester, propylene glycol fatty acid ester and lecithin, and a natural emulsifier as these surface active agents, a sterol, cholic acid, DESOKISHI cholic acid, a yucca extract, etc.

[0009] Furthermore, a stabilizer can be added to this invention, independent [ in polyhydric alcohol, such as gum arabic, xanthan gum, tragacanth gum, Cyamoposis Gum, gellant gum, locust bean gum, etc. propylene glycol, a glycerol or sugar-alcohol, for example, maltitol, a restoration water candy, the Lacty toll, palatinit, erythritol a sorbitol, and a mannitol. ] as a stabilizer used for this invention -- or two or more sorts can be mixed.

[0010] In order to raise emulsification or solubilization stability of the fats-and-oils content water solubility constituent of this invention, homogenization machines, such as a colloid mill, a high-pressure homogenizer,

a Micro fluidizer, and a nano mizer, an ultrasonic emulsifier, can be used.

[0011] Furthermore, the fats-and-oils content water solubility constituent of this invention can perform 100-150-degree C pasteurization or sterilization processing or if needed at 60-100 degrees C. Thus, the obtained fats-and-oils content water solubility constituent can maintain uniform emulsification or a solubilization condition, without producing a creaming or fats and oils dissociating, even if saved for a long period of time.

[0012] Even if it excels in acid resistance, the salt atmosphere, and thermal resistance and being saved for a long period of time, the purpose of this invention is offering the eating-and-drinking article containing the fats and oils which can maintain uniform emulsification or a solubilization condition without producing a creaming or fats and oils' dissociating, and can be attained on the occasion of manufacture of various eating-and-drinking articles by carrying out addition combination of the fats-and-oils content water solubility constituent of this invention. The fats-and-oils content water solubility constituent obtained as mentioned above can be taken in as it is, or can mainly be used for food, such as drinks and pans, such as a sport drink, a carbonated drink, and a nutrition drink, noodles, confectionary, milk processed meat, and a seasoning, as a feed ingredient for adding fats and oils, and the range does not exist and can apply especially a limit to all kinds of eating-and-drinking article.

[0013] As food containing the fats-and-oils content water solubility constituent of this invention, it hangs down and \*\*\*\* processed foods and bean paste, such as a pan and confectionary, such as a pan, a biscuit, Kandy, and jelly, and yogurt, a hum, the source, the health food made into the shape of the shape of powdered food, such as fats-and-oils processed foods and powder drinks, such as processed foods and margarine, such as seasonings and tofu, such as a dressing, and noodles, a fat-spread and shortening, and powdered soup, etc. and a capsule and a tablet, powder, granularity, etc. can be mentioned, for example

[0014] When considering as the drink containing the fats-and-oils content water solubility constituent of this invention, the high density liquid diet for the alimentation before liquid milk containing recombined milk besides being the drink which contains at least one sort out of minerals, such as salt, an acidulant, sweetners, alcohol, a vitamin, a flavor, and fruit juice, for example, a sport drink, a fruit-juice drink, a lactic acid bacteria beverage, an alcoholic beverage, a vitamin mineral drink, etc., soybean milk, and an operation, after an operation, etc. can be mentioned.

[0015] When the fats-and-oils content water solubility constituent of this invention is used for a drink, the drink can maintain uniform emulsification or a solubilization condition, without producing a creaming or fats and oils dissociating, even if saved for a long period of time. The drink containing the fats-and-oils content water solubility constituent of this invention can perform 100-150-degree-C pasteurization or sterilization processing or if needed at 60-100 degrees C.

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## EXAMPLE

[Example] Next, an example and the example of a comparison explain this invention to a detail further. the 150ml \*\*\*\*\* centrifugal precipitation tube of examples — deca glycerol MONOKAPURI rate [— trade name: — SY Glyster MCA-750 and the product made from Sakamoto Pharmaceutical industry — in order to see] 4g, [trade name:DK ester SS and Dai-Ichi Kogyo Seiyaku Co., Ltd. make] made from sucrose fatty acid ester 4g which contains monoester 95%, and acid resistance and to see 0.2g of citric acids, and the salt atmosphere, 0.2g of sodium citrates and 9.6g of water were put in, and it was made to dissolve completely the solution — medium-chain-fatty-acid triglyceride [— trade name: — PANASETO 810 and the Nippon Oil & Fats Co., Ltd. make —] 2g was put in, probe mold SONIKETA [form:SONIFIER 250 and the product made from BRANSON SONIC POWER COMPANY] was used, emulsification was performed for 1 minute, and the homogeneous fats-and-oils content water solubility constituent was obtained.

[0017] Except [ of the deca glycerol MONOKAPURI rate of example of comparison 1 example 1 ] instead having used the hexa glycerol MONOKAPURI rate [trade name:SY Glyster MCA-500 and the product made from Sakamoto Pharmaceutical industry], the completely same actuation as an example 1 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0018] The sucrose-fatty-acid-ester [trade name which contains monoester 70% instead of the sucrose fatty acid ester which contains the monoester of example [ of a comparison ] 2 example 1 95%: Except having used DK ester F-160 and] by Dai-Ichi Kogyo Seiyaku Co., Ltd., the completely same actuation as an example 1 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0019] the beaker made from example 23 liter-capacity stainless steel — deca glycerol monostearate [— trade name: — SY Glyster MS-750 and the product made from Sakamoto Pharmaceutical industry — in order to see] 100g, [trade name:DK ester SS and Dai-Ichi Kogyo Seiyaku Co., Ltd. make] made from sucrose fatty acid ester 100g which contains monoester 95%, and acid resistance and to see 70g of acetic acids, and the salt atmosphere, 30g of salt and 260g of water were put in, and it was made to dissolve completely the solution — soybean lecithin [— trade name: — Nissin lecithin and the Nisshin Oil Mills, Ltd. make — the oil phase which mixed] 40g and 1400g of rapeseed oil was mixed and stirred gradually, subsequently, it homogenized by the homogenization pressure of 300kg/cm<sup>2</sup>, and three counts of pass with the homogenizer [form:120 L/H and the product made from Sanwa Machine], and the homogeneous mayonnaise's fats-and-oils content water solubility constituent was obtained.

[0020] Except [ of the deca glycerol monostearate of example of comparison 3 example 2 ] instead having used deca glycerol tristearate [trade name:SY Glyster TS-750 and the product made from Sakamoto Pharmaceutical industry], the completely same actuation as an example 2 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0021] The sucrose-fatty-acid-ester [trade name which contains monoester 75% instead of the sucrose fatty acid ester which contains the monoester of example [ of a comparison ] 4 example 2 95%: Except having used the Ryoto sugar ester S-1670 and] made from Mitsubishi Kasei Food, the completely same actuation as an example 2 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0022] the beaker made from example 31 liter-capacity stainless steel — decaglycerin monooleate [— trade name: — SunSoft Q-17S and the TAIYO KAGAKU CO., LTD. make — in order to see] 15g, [trade name:DK ester SS and Dai-Ichi Kogyo Seiyaku Co., Ltd. make] made from sucrose fatty acid ester 15g which contains monoester 95%, and acid resistance, 7.5g of sodium ascorbate, [glycerol for trade name:food additives and Nippon Oil & Fats Co., Ltd. make] made from glycerol 150g, and 90g of water were put into the 2.5g [ of ascorbic acids ], and salt atmosphere \*\*\*\* sake, and it was made to dissolve completely the solution — mono-glycerine fatty acid ester [— trade name: — EMARUJI MU and the Riken Vitamin Co., Ltd. make — the oil phase which mixed] 15g, [trade name:SANRESHICHIN W-1 and TAIYO KAGAKU CO., LTD. make] made from lecithin 5g, and [trade name:SANOMEGA DHA27 and Nippon Oil & Fats Co., Ltd. make] made from purification tuna oil 200g — gradually — mixing and stirring — carrying out — subsequently — a Micro fluidizer [Form : M-110 E/H and product made from Mizuho Industry] It homogenized by the homogenization pressure of 1500kg/cm<sup>2</sup>, and one count of pass, and the homogeneous fats-and-oils content water solubility constituent was obtained.

[0023] Except having used only 30g (DK ester SS) of sucrose fatty acid ester which contains monoester 95% instead of 15g of sucrose fatty acid ester which contains decaglycerin monooleate 15g of example of comparison 5 example 3, and monoester 95%, the completely same actuation as an example 3 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0024] Except having used only decaglycerin monooleate 30g instead of 15g of sucrose fatty acid ester

which contains decaglycerin monooleate 15g of example of comparison 6 example 3, and monoester 95% (DK ester SS), the completely same actuation as an example 3 was performed, and the fats-and-oils content water solubility constituent was obtained.

[0025] Each fats-and-oils content water solubility constituent of examples 1-3 was shown in Table 1.

[0026]

[Table 1]

表 1

		実 施 例		
		1	2	3
乳 化 剤	A	デカグリセリン モノカプリレート 20	デカグリセリン モノステアレート 5	デカグリセリン モノオレレート 3
	B	シヨ糖脂肪酸 モノエステル95% 20	シヨ糖脂肪酸 モノエステル95% 5	シヨ糖脂肪酸 モノエステル95% 3
油 脂		パルミット810 10	オリーブ油 70	マクロ油 40
水		48	13	18
酸		クイン酸 1	酢酸 3.5	アスコルビン酸 0.5
塩		クイン酸ソーダ 1	食塩 1.5	アスコルビン酸ナトリウム 1.5
その他		—	レシチン 2	レシチン他 34

(単位：重量%)

[0027] Each fats-and-oils content water solubility constituent of the examples 1-6 of a comparison was shown in Table 2.

[0028]

[Table 2]

表 2

		比 較 例					
		1	2	3	4	5	6
乳 化 剤	A	ヘキサグリセリン モノカプリレート 20	デカグリセリン モノカプリレート 20	デカグリセリン トリスアレート 5	デカグリセリン モノステアレート 5	—	デカグリセリン モノオレート 6
	B	ソレ糖脂肪酸 モノエステル95% 20	ソレ糖脂肪酸 モノエステル70% 20	ソレ糖脂肪酸 モノエステル95% 5	ソレ糖脂肪酸 モノエステル75% 5	ソレ糖脂肪酸 モノエステル95% 6	—
油脂		パルメイト810 10	パルメイト810 10	タネ油 70	タネ油 70	マクロ油 40	マクロ油 40
水		48	48	13	13	18	18
酸		クエン酸 1	クエン酸 1	酢酸 3.5	酢酸 3.5	アスコルビン酸 0.5	アスコルビン酸 0.5
塩		クエン酸ソーダ 1	クエン酸ソーダ 1	食塩 1.5	食塩 1.5	アスコルビン酸 ナトリウム 1.5	アスコルビン酸 ナトリウム 1.5
その他		—	—	レシチン 2	レシチン 2	レシチン他 34	レシチン他 34

(単位：重量%)

[0029] The emulsion stability of Ushiro who took 20g to 30ml \*\* glassware, and heat-sterilized each fats-and-oils content water solubility constituent of examples 1-3 and the examples 1-6 of a comparison for 30 minutes at 85 degrees C was evaluated. Moreover, the emulsion stability when saving these fats-and-oils content water solubility constituents at 60-degree-C thermostat during 15 days was evaluated. The evaluation result was shown in Table 3.

[0030]

[Table 3]

表 3

	平均粒径 ( $\mu$ )	85℃で30分間の 加熱後の乳化安定性	60℃で15日間の 保存後の乳化安定性
実施例 1	0.24	良好	良好
実施例 2	0.28	良好	良好
実施例 3	0.21	良好	良好
比較例 1	測定不能	分離	分離
比較例 2	測定不能	分離	分離
比較例 3	測定不能	分離	分離
比較例 4	測定不能	分離	分離
比較例 5	1.11	良好	分離
比較例 6	1.28	良好	分離

[0031] From the result of Table 3, a citric acid is added as acid resistance, a sodium citrate is added as the salt atmosphere in the example 1, and it is acid resistance at an example 2. Salt can be added as an acetic acid and the salt atmosphere, in the example 3, even if it heat-sterilizes for 30 minutes at 85 degrees C, also when emulsion stability is good and saves clearly at 60-degree-C thermostat during 15 days, it does not dissociate, but these fats-and-oils content water solubility constituent that added the ascorbic acid as acid resistance and added sodium ascorbate as the salt atmosphere excels [ all ] in acid resistance, the salt atmosphere, and thermal resistance, and they can use it as the raw material of an eating-and-drinking article, or an eating-and-drinking article. It dissociated, when it saved at 60-degree-C thermostat during 15 days, although emulsified in Ushiro who mean particle diameter of emulsification is stable about examples 1-3 less than [ 0.3mmicro ], emulsified liquid dissociates in the examples 1-4 of a comparison, measurement is impossible, and mean particle diameter is large in the examples 5-6 of a comparison at more than 1.0mmicro, and was not stabilized by the emulsification condition, but heat-sterilized for 30 minutes at 85 degrees C.

[0032] Each ingredient was blended and stirred by the presentation of example 4 table 4, and the source was obtained. After saving for three months immediately after manufacture of this source, and at 10 degrees C, when emulsion stability was evaluated, separation of an oil phase was not accepted at all, but emulsification was stable.

[0033]

[Table 4]

表 4

材 料	配合量 (g)
実施例 2 の油脂含有水溶性組成物	4 0 0
トマトケチャップ	1 2 0
プレーンヨーグルト	6 0
練り辛子	1 0
パブリカ	1 0

[0034] In example of comparison 7 example 4, the source was obtained like the example 4 except having changed the fats-and-oils content water solubility constituent of the example 2 in the charge of a compounding agent of Table 2 into the fats-and-oils content water solubility constituent of the example 3 of a comparison. After saving for three months immediately after manufacture of these sources, and at 10 degrees C, when emulsion stability was evaluated, in any case, separation of an oil phase was accepted, and it was judged that emulsification was unstable and could not be used as a product.

[0035] The drink was prepared with each ingredient of the presentation shown in example 5 table 5, and 100ml \*\* bottle was filled up and it sealed. This drink was heat-sterilized for 15 minutes at 95 degrees C, and the drink was obtained. Thus, after saving the obtained drink for two months at 40 degrees C, when emulsion stability was evaluated, separation of an oil phase was not accepted at all, but emulsification was stable.

[0036]

[Table 5]

表 5

材 料	配合量 (g)
実施例 3 の油脂含有水溶性組成物	0 . 0 1 3
上白糖	5 8 . 3 0
ブドウ糖	6 . 0 0
クエン酸	1 . 8 0
食塩	0 . 3 5
クエン酸ナトリウム	0 . 3 0
アスコルビン酸	0 . 0 6
アスコルビン酸ナトリウム	0 . 0 1
リン酸三カリウム	0 . 0 4
リン酸三カルシウム	0 . 0 8
シトラスミックスフレーバー	1 . 0 0
水	9 3 2 . 0 4 7

[0037] In example of comparison 8 example 5, the drink was obtained like the example 5 except having changed the fats-and-oils content water solubility constituent of the example 3 in the charge of a compounding agent of Table 5 into the fats-and-oils content water solubility constituent of the example 6 of a comparison. In any case, when emulsion stability was evaluated like the example 5, the creaming produced these drinks, and emulsification is unstable and was not able to be used as a product.

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